BIDOVEC, Franc, sanitetski potpukovnik dr; DEBIJADI, Rudi, sanitetski major dr; RISAVI, Antun, sanitetski potpukovnik dr.; STRMOTIC, Emilija, prof; VASIC, Zivorad, prof.

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(AVIATION MEDICINE)

BIDOWA, I.

BIDOWA, I. The development of cooperative agricultural associations in Szamotuly District. P. 43.

No. 2, 1956
ZAGADNIENIA EKONOMIKI ROLNEJ
AGRICULTURE
Warszawa, Poland

So: East European Accession, Vol. 6, no. 3, March 1957

BIDOWA, I.

Collective farms in old villages of Koscian District; an example of the Associated Farm Collective in Wlawie. p. 548

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Vol. 8, no. 14, July 1959

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Uncl.

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Laboratory control of the manufacture of fodder yeast from residual bisulfitic solutions. Cel hirtie 13 no.10:379-383 O '64.

PRZHIBYL, Yozef [Přibyl, Josef]; ZHUKOV, A.A., inzh. [translator]; BIDUL', P.N., prof., doktor tekhn.nauk, zasluzhennyy deyatel' nauki i tekhniki, red.; MARKIZ, Yu.L., inzh., red.izd-va; DOBRITSYNA, R.I., tekhn.red.

[Theory of casting] Nekotorye voprosy liteinoi teorii. Pod red. P.N.Bidulia. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit. lit-ry, 1961. 138 p.
(Founding) (MIRA 14:6)

BIDENKO, M. I.

"Larval Trematode Fauna of the Mollusks of the Dnepr River." Cand Biol Sci, Inst of Zoology, Acad Sci Ukrainian SSR, Kiev, 1955. (KL, No 12, Mar 55)

So: Sum. No 670, 29 Sept 55 - Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (15)

BIDULY'A, B., inzh.

"Fire" turbine. IUn. tekh. 5 no. 11:13-17 N '60. (MIRA 13:12)
(Gas turbines)

BIDULYA, B., inzh.

Giant turbines. IUn.tekh. 5 no.4:11-17 Ap '61. (MIRA 14:3)
(Steam turbines)

Bidulya, B.P.

AID Nr. 980-5 31 May

GAS TURBINE CONFERENCE (USSR)

Bidulya, B. P. Teploenergetika, no. 5, May 1963, 91-93.
S/096/63/000/005/011/011

An All-Union scientific and technical conference on gas turbines was held at the Moscow Higher Technical School imeni Bauman from 29 to 30 January 1963. Over 300 representatives from schools of higher education, scientific research institutes, turbine-building plants, and other organizations attended. Eighteen papers dealing with high-power gas-turbine power plants and high-temperature gas turbines were presented. The following were reported: 1) Most of the problems dealing with gas-turbine power plants of 200-400 Mw with efficiency of the order of 40-45% at inlet temperatures of 750-800°C have been solved. 2) A preliminary design has been completed for a 200-Mw dual-shaft gas-turbine unit with an efficiency of 42-44%, air consumption of 400 kg/sec, compression

Card 1/2

AID Nr. 980-5 31 May

GAS TURBINE CONFERENCE (Cont.) S/096/63/000/005/011/011

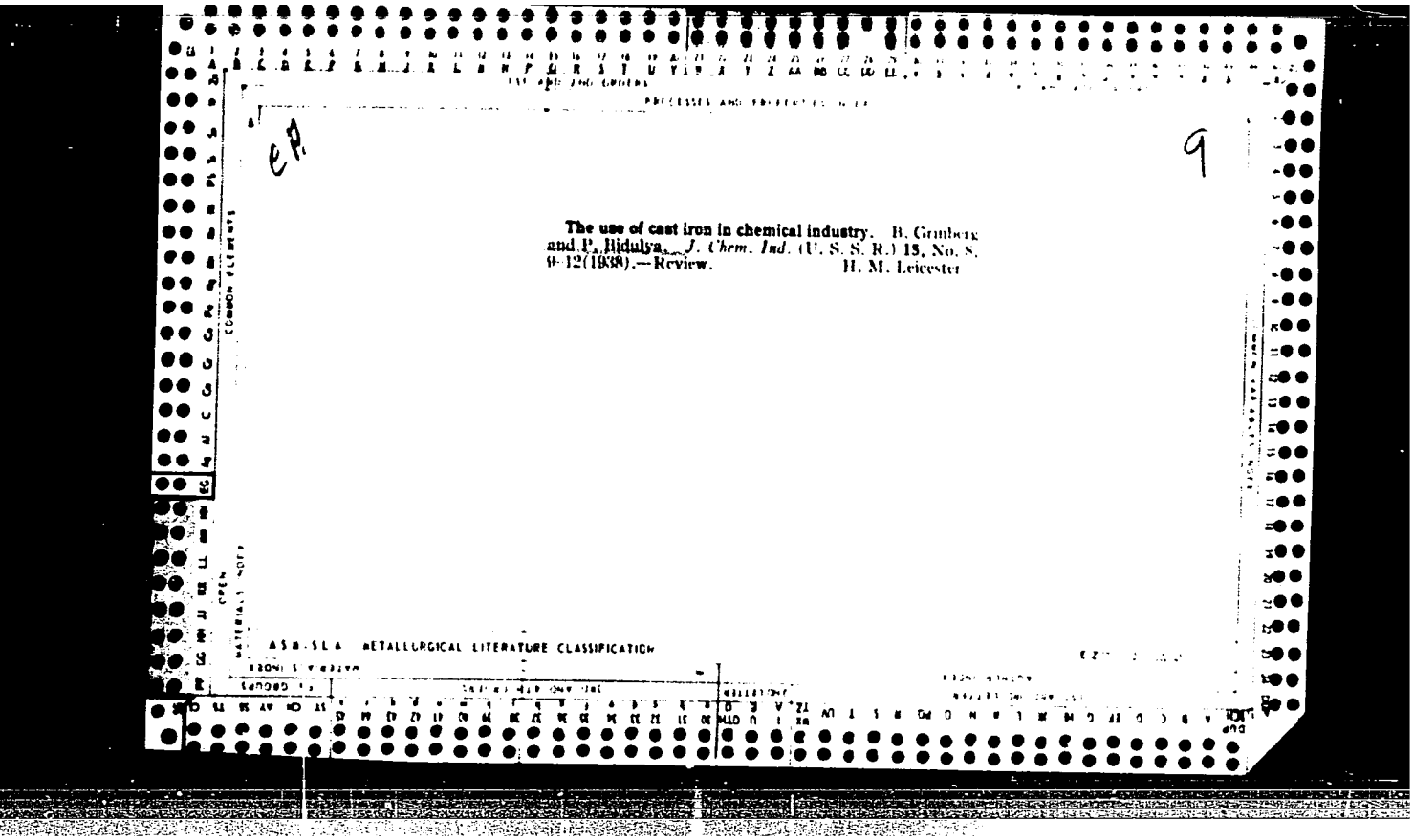
ratio of 128, and inlet temperature of 800°C. The unit has three intermediate combustion chambers and four air coolers. 3) Preliminary experimental results have been obtained on compact radial-annular diffusors with 90° deflection angle. 4) An experimental single-stage high-temperature water-cooled gas turbine with an inlet temperature of 1200°C has been designed. 5) An approximate analytical method has been developed for calculating the temperature distribution along the profile of a turbine blade with internal air cooling. 6) Preliminary results have been obtained from experiments with the shell-type blade, which consists of an inner load-carrying rod and an outer thin-walled shell made of heat-resistant steel working in compression and air cooled. The blade reportedly can operate at gas temperatures of 1000-1200°C. 7) Several systems have been developed for air cooling gas turbine rotors. The program adopted by the conference includes research on gas turbine cooling, improving efficiency of compressors, turbines, combustion chambers, nozzles and diffusors, intercoolers, and heat exchangers, and the development of high-temperature and intermediate combustion chambers. [AS]

Card 2/2

BIDULYA, L.N.

BARLIN, I.P.; BORISOV, A.F.; BELAN, R.V.; YERMOLAYEV, G.I.; VAYSBERG, L.E.; ZHEREBIN, B.N.; BORODULIN, A.I.; SHAROV, G.V.; DOMNITSKIY, I.F.; CHUSOV, F.P. SOROKO, L.N.; KLIMASENKO, L.S.; PAVLOVSKIY, S.I.; ZIL'BERSHTEYN, M.B.; LYULENKOV, I.S.; NIKULINSKIY, I.D.; BRAGINSKIY, I.A.; SALOV, Ye.M.; TROSHIN, N.F.; PETRIKEYEV, V.I.; ARGUNOV, M.I.; DUL'NEV, F.S.; BIDULYA, L.N. GAYNANOV, S.A.; FROLOV, N.P.; VINICHENKO, V.S.; KOGAN, Ye.A.

G.E.Kazarnovskii; obituary. Stal' 15 no.8:757 Ag'55. (MLRA 8:11)
(Kazarnovskii, Grigorii Efimovich, 1887-1955)



The use of cast iron in chemical industry. B. Grinberg and P. Bidulya. *J. Chem. Ind.* (U. S. S. R.) 15, No. 8, 9–12(1938).—Review. H. M. Leicester

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

BIDULYA, P. N. Prof

USSR/Engineering - Foundry Practice Jan 51

"Review of 'Rational Technological Processes of Casting,'" Prof P. N. Bidulya, Dr Tech Sci

"Litey Proiz" No 1, pp 35, 36

Book is symposium of articles, published by Chair of Machs and Casting Tech of Higher Tech School imeni N. E. Bauman, edited by Prof N. N. Rubtsov, head of the Chair. Some of articles are: "Effect of Vibrations During Solidification of a Casting on Its Properties," "Investigations of Influence of Alloying Elements on Improving Mechanical

185T46

USSR/Engineering - Foundry Practice (Contd) Jan 51

"Review

Properties of Gray Cast Iron," "Investigation of Effect of Heat Treatment on Mechanical Properties of Perlitic Malleable Iron," "On the Theory of Formation of Temper Carbon Through a Solid Solution."

185T46

BIDULYA, P. N.; PROF

PA 196T95

USSR/Metals - Cast Iron, Properties Jul 51

"Magnesium Treated Cast Iron With Granular Form of Graphite," Prof P. N. Bidulya, Dr Tech Sci

"Litey Proizvod" No 7, p 1

Briefly discusses application of Mg as inoculant for improving structure and mech properties of cast iron. Cast iron inoculated with Mg differs little from steel technologically. Therefore, designing of molds embodies all steel-castings production measures for securing directional solidification, for

196T95

USSR/Metals - Cast Iron, Properties (Contd) Jul 51

feeding castings during pouring process, and for stage of shrinkage during solidification.

196T95

BIDULYA, P.N.

PHASE I TREASURE ISLAND BIBLIOGRAPHICAL REPORT AID 329 - I

BOOK Call No.: AF617188

Author: BIDULYA, P. N., Prof., Doc. Tech. Sci.
Full Title: FOUNDRY PRODUCTION (GENERAL COURSE)
Transliterated Title: Liteynoye proizvodstvo (Obshchiy kurs)

Publishing Data
Originating Agency: None
Publishing House: State Publishing House of Scientific and Technical Literature on Ferrous and Nonferrous Metallurgy
Date: 1953 No. pp.: 427 No. of copies: 15,000

Editorial Staff
Editor: None
Tech. Ed.: Prof., Doc. Tech. Sci. Spasskiy, A. G. (Parts 1 and 5); Prof., Doc. Tech. Sci. Fantalov, L. I. and Dots., Kand. of Tech. Sci. Zhevtunov, P. P. (Part 2)
Editor-in-Chief: None
Appraiser: None
Others: Dots. V. V. Arkhipov (assisted in preparing material on foundry shop); members of the Department of Foundry Production (institution not given); engineers of the Novo-Kramatorsk Heavy Machine-Building Plant imeni I. V. Stalin

Evaluation B-74959

Liteynoye proizvodstvo (Obshchiy kurs) AID 329 - I

Text Data

Coverage: This book presents the fundamental principles of foundry work: treatment and processing of metal alloys, crystallization, cooling, and mechanical properties of the casting. Separate sections are given to the production of cast iron, steel casting, and castings from nonferrous metals and their alloys. Structural formation, flowability, and physical and chemical properties of each type of casting are discussed. Special attention is given to quality control, to the casting of iron, of steel, and of alloys of nonferrous metals, and to the technology of the preparation of the casting form. The process flow in the casting shop is discussed in the last section.

While this is a good textbook, it is planned for metallurgical students not specializing in founding practice, and apparently contains no material for the specialist.

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Liteynoye proizvodstvo (Obshchiy kurs) AID 329 - I

Liteynoye proizvodstvo (Obshchiy kurs) AID 329 - I

Liteynoye proizvodstvo (Obshchiy kurs) AID 329 - I

Purpose: Approved as a textbook by the Main Administration of Higher Education for metallurgical students not specializing in founding.

Facilities: Many scientists and technical workers are mentioned in the text.

No. of Russian and Slavic References: 30 after 1939

Available: A.I.D., Library of Congress.

BIDULYA, P.N.

LADYZHENSKIY, B.N., kandidat tekhnicheskikh nauk; TUNKOV, V.P., laureat Stalinskoy premii, inzhener; BIDULYA, P.N., doktor tekhnicheskikh nauk, professor, retsenzent; KONOPASEVICH, V.A., inzhener, redaktor; MODEL', B.I., tekhnicheskiy redaktor

[Smelting steel for mold casting] Vyplavka stali dlia fasonnogo lit'ia. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1954. 382 p. (MLRA 7:10)
(Steel castings)
(Smelting)

BIDULYA, P. N.

USSR/Miscellaneous - Foundry processes

Card 1/1 : Pub. 61 - 9/23

Author : Bidulya, P. N.

Title : Castings from graphitized steel

Periodical : Lit. proizv. 4, 22-23, July 1954

Abstract : The properties of ordinary and low-alloyed graphitized steel were investigated by the Metallurgical Faculty of the I. V. Stalin Metallurgical Institute in Moscow, to determine the feasibilities of using this type of steel in industry. Graphitized steel castings belong to new types of goods with steel basis from which the graphite was removed in globular form. Graphitized steels respond well to various types of thermal treatments. The mechanical properties of graphitized steel, are described.

Institution : ...

Submitted : ...

SOV/137-57-1-698

Translation from: Referativnyy zhurnal. Metallurgiya, 1957, Nr 1, p 90 (USSR)

AUTHOR: Bidulya, P. N.

TITLE: Seepage of Gases and Liquids Into the Outer Shell Layer of a Non-metallic Mold (Fil'tratsiya gazov i zhidkostey v obolochkovom sloye nemetallicheskoy liteynoy formy)

PERIODICAL: Sb. tr. Mosk. vech. metallurg. in-ta, 1955, Nr 1, pp 3-8

ABSTRACT: An examination of the problem of seepage of gases evolved in a mold (M) during pouring of metal. Of the three possible conditions of gas pressure within the pores of the M, $P_M > P_o$; $P_M = P_o$, $P_M < P_o$ (P_M is the pressure within the pores of the M, and P_o the ferrostatic pressure on the M) the first results in "boiling" of the M, i.e., in passage of gases from the M to the liquid metal, a condition which may lead to the appearance of blow holes, and the third results in the penetration of metal into the pores of the M thus causing particles of the M material to adhere to the rough surface of the casting. Only in the case when $P_M = P_o$ can high-quality castings be obtained. The motion of the gases through the pores is explained by the Slichter equation $G = d^2(P_M^2 - P_o^2)/192\mu kRT\delta$ g/sec·cm^2, where G is the weight

Card 1/2

Seepage of Gases and Liquids Into the Outer Shell Layer of a Non-metallic Mold

of the gas passing in one second through an area of 1 cm^2 of the permeable medium; d the mean diameter of particles of that medium in cm; μ the coefficient of hydraulic resistance to the passage of gases; k the seepage coefficient, and δ the thickness of the permeable layer. In order to prevent penetration of gases from the M into the metal of the casting, it is imperative that the surface some tenths of a mm thick) of the M consist of a dense substance with small permeability (which, however, must not be equal to zero) and limited capacity for gas evolution. The gas permeability of the rest of the material of the M must be significantly greater than the gas permeability of the surface layer. The quantity of gases penetrating from the M into the casting must not exceed their solubility in liquid metal. Zero permeability of the surface layer is not desirable because it may lead to distortion or scorching of the M.

Ya. M.

BIDULYA, Pavel Nikolayevich, professor, doktor tekhnicheskikh nauk; KRYLOV, V.I., inzhener, redaktor; SIDOROV, V.N., inzhener, redaktor izdatel'stva; VAYNSHTEYN, Ye.B., tekhnicheskiy redaktor

[The technology of founding] Tekhnologiia liteinogo proizvodstva. Moskva, Gos. nauchno-tekhn. izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1956. 614 p. (MLRA 10:1)
(Founding)

Bidulya, P. N.

Distr: 4E2c

Technological Construction of Heat Resisting Castings. P. N. Bidulya, V. P. Desnitskii and S. P. Nestertsev. (*Liteinoe Proizvodstvo*, 1956, (4); 1-4). [In Russian]. In this article problems in the design of heat-resisting castings of high-alloy types of austenitic steel are considered. The importance of allowing for the relatively high viscosity of such steels is indicated and the defects caused by ignoring this factor are considered. Points made are exemplified by the high pressure cylinder of a gas turbine.—S. K.

18 4 1

BIDULYA, P. N.

14927* (Russian.) Crystallization of Liquid Steel Under Pressure. **Kristallizatsiia zhidkoi stali pod davleniem.** P. N. Bidulia, I. I. Bobrov, and K. N. Simirnova. *Litcinoe Proizvodstvo*, 1956, no. 7, June 1956, p. 1-4.

Equipment and methods. Advantages in comparison with ordinary cast and rolled steels.

Bidulya, P. N.

Distr: 4E2c

Prospects and Methods for Lowering the Weight of Castings. P. N. Bidulya. (*Liteinoe Proizvodstvo*, 1956 (11), [1-2]. [In Russian]. The author complains that too little attention is given to practically applicable topics by research organizations and gives some examples of problems for solution in the foundry field. These deal mainly with the use of new materials and designs to reduce the weight of castings.—E. K.

18

2

[illegible], Ivan Nikolayevich

TEKHNOLOGIYA LITEYNOGO PROIZVODSTVA (TECHNOLOGY OF THE CASTING INDUSTRY)
MOSKVA, MASHGIZ, 1956.

614, (2) P. ILLUS., DIAGS., GRAPHS, TABLES.

BIBLIOGRAPHY: P. (614)

BIDULYA, P.N.

Category : USSR/Solid State Physics - Phase Transformation in Solid Bodies E-5

Abs Jour : Ref Zhur - Fizika, No 2, 1957 No 3837

Author : Bidulya, P.N., Bobrov, I.I., Smirnova, K.N.
Title : Crystallization of Liquid Steel under Pressure

Orig Pub : Liteynoye proiz-vo, 1956, No 7, 1-4

Abstract : No abstract

Card : 1/1

PRZHIBYL, Iozef [Přibyl, Josef], doktor-inzhener; IVANOV, Ye.V., inzhener [translator]; BIDULYA, P.M., doktor tekhnicheskikh nauk, redaktor; GRUSHEVSKAYA, G.M., redaktor izdatel'stva; MATVEYEVA, Ye.N., tekhnicheskiy redaktor

[Solidification and feeding of castings. Translated from the Czech] Zatverdevanie i pitanie otlivok. Perevod s cheshskogo E.V.Ivanova. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1957. 286 p. (MLRA 10:7)

1. Zaveduyushchiy kafedroy "Liteynoe proizvodstvo v Gorno-metallurgicheskom institute v Ostrave (for Przhibyl)
(Steel castings)

BIDULYA, P.N.

BIDULYA, P.N.

Forty years of Soviet steel casting practices. Lit.proizv. no.10:4-5 O '57. (MIRA 10:12)
(Founding) (Steel castings)

Bidulya P.M.

137-1958-3-4814

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 3, p 51 (USSR)

AUTHORS: Bidulya, P.M., Manakin, A. M.

TITLE: Determination of the Composition and Amount of the Exothermic Mixture Employed in the Heating of Risers of Steel Castings (Opredeleniye sostava i kolichestva ekzotermicheskoy smesi dlya podogreva pribyley stal'nykh otlivok)

PERIODICAL: Sb. tr. Mosk. vech. metallurg. in-t, 1957, Nr 2, pp 18-39

ABSTRACT: A brief history of the origin of thermit compounds, employed in the heating of risers of ingots and castings, and basic criteria for their composition, as well as a listing of properties required for inert fillers. The computation of the temperature developed in the burning of the Fe-Al thermit is given (its value is established at appx. 2700°) together with computations dealing with temperature changes in the process if 25 percent of Al_2O_3, SiO_2, or CaO are added to the mixture. It is established the greatest reduction in the temperature is produced by an addition of Al_2O_3. CaO is recommended as the optimal filler, while the most desirable slags should be of the $CaO-SiO_2-Al_2O_3$ system, with

Card 1/2

Determination of the Composition and Amount of the Exothermic (cont.)

a melting point at 1300-1400°. Cement and water glass are recommended as binders for molded mixtures. Results of tests performed on some molded mixtures are shown, and the composition of the best mixture is given (in parts by weight): 75 of Fe-Al thermit, 25 of Portland cement, and 10 of water. Problems of the distribution of the heat created by the burning of the thermit riser compounds are discussed, and it is pointed out that the efficiency of the process of burning of the Fe-Al thermit amounts to 0.40 - 0.45. Methods are given for the computation of changes in the heat content of the riser system during heating and the amounts of the thermit mixture required for sound castings, as well as the results of experimental tests on the last mentioned requirement.

A. Sh.

SOV-128-58-7-1/20

AUTHOR: Bidulya, P.N., Doctor of Technical Sciences

TITLE: New Foundries in Heavy Machine Building Plants. (Novyye liteynyye tsekhi zavodov tyazhelogo mashinostroyeniya)

PERIODICAL: Liteynoye proizvodstvo, 1958, Nr 7, pp 1-2 (USSR)

ABSTRACT: The author discusses the present state of USSR foundries and indicates the technical and organizational changes necessary to eliminate bottlenecks found now in the foundries, due to a planned increased output of mining, metallurgical, forging and other large machines. The slowness of foundry processes, unbelievably crowded large-casting bays with piles of molds, heaps of stripped castings, gas and dust in the air, unbearable heat in pouring-and-stripping bays, permanent scarcity of highly skilled workers due to poor working conditions, are mentioned. Suggested changes are as follows: 1) the use of pneumatic handling (in pipes) of dry dust-forming materials and the "CO_2 process" (now in use in Czechoslovakia), 2) replacement of the sand-jet cleaning process by hydro-sand-shot cleaning; 3) the remodeling of foundry buildings enabling proper ventilation; 4) the organization and special-

Card 1/2

New Foundries in Heavy Machine Building Plants SOV-128-58-7-1/20

ization of foundries. There are 6 references, 4 of which are Soviet, 1 German and 1 English.

1. Industrial plants--USSR 2. Founderies---Organization

Card 2/2

AUTHORS: Bidoliya, P.N.
Trubitsyn, N.A., Engineer, and Bidoliya, P.N., Doctor of Technical Sciences

TITLE: The Effect of the Composition of Steel on the Formation of Hot Cracks in Castings. (Vliyaniye sostava stali na obrazovaniye goryachikh treshchin v otlivkakh)

PERIODICAL: Liteynoye Proizvodstvo, 1958, Nr 6, pp 22-26 (USSR)

ABSTRACT: The purpose of the described experiments at TsNIITMASh was to determine the effect of carbon, sulphur, manganese, silicon and phosphorus content on the resistance of carbon steel to the formation of cracks during solidification. A specially designed electric device for measuring the disrupting forces in metal during shrinkage is described and illustrated (Fig.1). The crystallization phenomena observed are described in detail. It was revealed that raising the Mn content increased the quantity of sulphides, while at lower Mn content the sulphides formed thin intercrystalline films reducing the crack resistance. A definite interdependence could be seen between the crack-resistance and the disposition of the sulphides, and it was possible to partially neutralize the negative effect of sulphur by increasing the manganese content. The negative effect of

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The Effect of the Composition of Steel on the Formation of Hot Cracks in Castings.

phosphorus grew with the increase of the carbon content. Higher sulphur content (at equal contents of carbon and phosphorus and an equal proportion of sulphur and manganese) gave higher contamination of steel by low-melting non-metallic inclusions distributed along the primary grain borders, and sharply decreased crack resistance. The experiments were carried out by the authors and Candidate of Technical Sciences V.N. Saveyko. There is 1 drawing, 10 diagrams, 1 table and 10 references, 9 of which are Soviet and 1 German.

AVAILABLE: Library of Congress

Card 2/2 1. Steel castings-Test results 2. Steel castings-Defects
3. Steel castings-Fracture

TRUBITSYN, Nikolay Alekseyevich, inzh.; SAVEYKO, Vladislav Nikolayevich, kand. tekhn. nauk; BIDULYA, Pavel Nikolayevich, doktor tekhn. nauk; SAMOKHOTSKIY, A.I., inzh., red.; SHVETSOV, G.V., tekhn. red.

[Hot crack resistance in carbon steel castings]Goriachaia treshchinoustoichivost' litoi uglerodistoi stali. Moskva, Filial Vses. in-ta nauchn. i tekhn. informatsii, 1958. 13 p. (Peredovoi nauchno-tekhnicheskii i proizvodstvennyi opyt. Tema 1. No.M-58-207/4)
(MIRA 16:3)

(Steel castings--Defects) (Thermal stresses)

BERG, P.P., doktor tekhn.nauk; BIDULYA, P.N., doktor tekhn.nauk; GRECHIN, V.P., kand.tekhn.nauk; DOVGALEVSKIY, Ya.M., kand.tekhn.nauk; ZHUKOV, A.A., inzh.; ZINOV'YEV, N.V., inzh.; KRYLOV, V.I., inzh.; KUDRYAVTSEV, I.V., doktor tekhn.nauk; LANDA, A.F., doktor tekhn. nauk; LEVI, L.I., kand.tekhn.nauk; MALAKHOVSKIY, G.V., inzh.; MIL'MAN, B.S., kand.tekhn.nauk; SOBOLEV, B.F., kand.tekhn.nauk [deceased]; SKOMOROKHOV, S.A., kand.tekhn.nauk; STEPIN, P.I., kand.tekhn.nauk; USHAKOV, A.D., kand.tekhn.nauk; FRIDMAN, L.M., inzh.; KHRAPKOVSKIY, E.Ya., inzh.; TSYPIN, I.O., kand.tekhn.nauk; SHKOL'NIKOV, E.M., kand.tekhn.nauk; POGODIN-ALEKSEYEV, G.I., prof., doktor tekhn.nauk, red.; BOLKHOVITINOV, N.F., prof., doktor tekhn. nauk, red.toma; LANDA, A.F., prof., doktor tekhn.nauk, red.toma; RYBAKOVA, V.I., inzh., red.izd-va; SOKOLOVA, T.F., tekhn.red.

[Handbook on materials used in the machinery industry] Spravochnik po mashinostroitel'nym materialam; v chetyrekh tomakh. Pod red. G.I.Pogodina-Alekseeva. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry. Vol.3. [Cast iron] Chugun. Red.toma N.F.Bolkhovitov i A.F.Landa. 1959. 359 p. (MIRA 13:1)
(Machinery industry) (Cast iron)

Bidulya, P.N.

25(1); 18(5) PHASE I BOOK EXPLOITATION SOV/2359

Akademiya nauk SSSR. Institut metallurgii

Goryachiye treshchiny v svarnykh soyedineniyakh slitkakh i otlivkakh (Hot Cracks in Welds, Ingots, and Castings) Moscow, Izd-vo AN SSSR, 1959. 163 p. 2,700 copies printed.

Ed.: N. N. Rykalin, Corresponding Member, USSR Academy of Sciences; Ed. of Publishing House: V. S. Rzheznikov; Tech. Ed.: Yu. V. Rylina.

PURPOSE: This book is intended for metallurgists and welding engineers.

COVERAGE: This is a collection of scientific papers dealing with the formation of hot cracks in ingots, castings, and welded products. Some papers are concerned mainly with the nature or mechanism of the phenomenon; others examine the effect of factors such as steelmaking procedure. Sufficient evidence is presented to identify some of the causes of hot cracks. Various means of investigating and preventing the phenomenon are described. A number of references, both Soviet and non-Soviet, accompany the papers. For further coverage [illegible]

Bidulya, P. N., V. G. Grusin, and V. N. Saveyko. Formation and Prevention of Hot Cracks in Steel Castings 39

As a criterion for the quantitative determination of the resistance of steel to the formation of exterior hot cracks, the author finds it convenient to employ the concept of "crack resistance", or the force required to form a crack during the shrinkage of a standard cast specimen with rigidly fastened ends. For mild carbon steel and low-alloy (Cr, Mo, V) structural steel, pouring temperature is one of the most important factors in crack development. Filling the molds with steel at the temperature of the liquidus or below should be avoided. A direct relationship between crack resistance and linear shrinkage, fluidity, and gas liberation was established. Increasing the fluidity of the mushy stage by changing the composition or the conditions helps to increase the crack resistance. Sulfur, hydrogen, and methane decrease the crack resistance of steel. Additions of manganese, molybdenum, and vanadium to carbon steel or low alloy steel increase the crack resistance. The manganese content should be held at a maximum so as to assure a ratio of Mn/S $\leq$ 13.

Gulyayev, B. B., I. I. Lapyrev, and L. M. Postnov. Formation of Hot Cracks in Steel Castings 51

The author recommends the following measures for controlling hot cracks in steel castings: 1) decreasing the size of the casting and eliminating projections by casting in several pieces with subsequent welding of the components; 2) Equalization of the cooling rates of various parts of the casting and elimination of conjugate parts through a rational determination of the thickness of their elements; 3) increasing fillet radii; 4) rejection of X-shaped designs and conjugate walls at angles of less than 90°; 5) increasing the pliancy of molds through the use of more pliable molding media and by pitting the molds; 6) strengthening weak spots through the use of chills and ribbing; 7) regulating the metal composition, insofar as possible, and the pouring conditions so as to reduce the probability of crack development. Consistent application of these measures, the author states, will effectively prevent hot cracks from development. Consistent application of these measures, the author states, will effectively prevent hot cracks from developing.

Pokhodnya, I. K. Hot (Crystallization) Cracks in the Hard Facing of High-Carbon Low-Chrome Steels 68

The author discusses the nature and mechanism of hot-crack formation and examines various factors contributing to it (chemical composition of added metal, cooling rate, etc.).

Medovar, B. I. Hot Cracks in the Welding of Chrome-Nickel Austenitic Steels 92

Bidulya, P.N.

24(8) PHASE I BOOK EXPLOITATION SOV/2117

Soveshchaniye po eksperimental'noy tekhnike i metodam vysokotemperaturnykh issledovaniy, 1956

Eksperimental'naya tekhnika i metody issledovaniy pri vysokikh temperaturakh; trudy soveshchaniya (Experimental Techniques and Methods of Investigation at High Temperatures; Transactions of the Conference on Experimental Techniques and Methods of Investigation at High Temperatures) Moscow, AN SSSR, 1959. 789 p. (Series: Akademiya nauk SSSR. Institut metallurgii. Komissiya po fiziko-khimicheskim osnovam proizvodstva stali) 2,200 copies printed.

Resp. Ed.: A.M. Samarin, Corresponding Member, USSR Academy of Sciences; Ed. of Publishing House: A.L. Bankvitser.

PURPOSE: This book is intended for metallurgists and metallurgical engineers.

COVERAGE: This collection of scientific papers is divided into six parts: 1) thermodynamic activity and kinetics of high-temperature processes 2) constitution diagram studies 3) physical properties of liquid metals and slags 4) new analytical methods and production of pure metals 5) pyrometry, and 6) general questions. For more specific coverage, see Table of Contents.

A versatile new instrument was developed for determining free linear shrinkage, hindered (or retarded) shrinkage, forces developing during hindered shrinkage, and resistance of the metal to the formation of hot cracks. By means of this instrument it was shown that steel with a peritectic composition (about 0.2 percent C) exhibits maximum resistance to the formation of hot cracks. This resistance falls sharply both with a decrease and an increase in carbon content. But with an increase the resistance falls only until a content of 0.5 percent C has been reached; with greater amounts of carbon the resistance begins to rise again. The effect of manganese content and teeming temperature on hot-crack formation were also investigated.

Card 14/32

BIDULYA, P.N.

"Casting design" by Fratisek Pisek. Reviewed by P.N. Bidulia.
Lit. proizv. no.1:3 of cover Ja '59. (MIRA 12:1)
(Founding)

B. DULYA, P.N., prof., doktor tekhn. nauk; KUKSIN, A.S., inzh.

Effect of the method of melting pig iron in cupolas and certain other technological factors on the properties of iron castings. Izv. vys. ucheb. zav.; chern. met. 2 no.4:93-100 Ap '59.
(MIRA 12:8)

1.Moskovskiy vechernyy metallurgicheskiy institut. Rekomendovano kafedroy metallurgii stali i liteynogo proizvodstva Moskovskogo vechernego metallurgicheskogo instituta.
(Iron founding)

18(0)

SOV/128-59-6-25/25

AUTHOR: Ridulya, P. N., Doctor of Technical Sciences

TITLE: The 1956 Leipzig Conference of Foundrymen

PERIODICAL: Liteynoye Proizvodstvo, 1959, Nr 6, p 48 (USSR)

ABSTRACT: One book is listed with a brief description

Card 1/1

USCOMM-DC-60,959

BIDULYA, P.N., PRZHIBYL, I., TELIS, M.Ya., FOKIN, G.F., SOSNENKO, M.N., POZDNYSHEV, V.M., SOROKIN, A.I.

"Special methods of casting" by S. IA. Golovin. Reviewed by P.N. Bidulia and others. Lit. proizv. no.6:3 of cover Je '60. (MIRA 13:8)

(Founding)
(Golovin, IA.)

20275

11500 also 1454, 1496

S/148/60/000/009/006/025
A161/A030

AUTHORS: Bidulya, P.N., and Smirnova, K.N.

TITLE: Peculiarities of liquid steel pressing under high pressure

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Chernaya metallurgiya, no.9, 1960, 43-49

TEXT: Pressing during crystallization is used for copper and aluminum alloys, but it has not yet been used for steel in the USSR or abroad. Detailed information is given on the application of high pressure for the production of steel parts from semi-liquid steel subjected to high pressure during crystallization in a press mold. The difference from the conventional pressure die casting consists in pressing until the metal completely solidifies. Pressure has to be not below 5-6 kg/mm^2. The method has been used for producing wheels (Fig.3). Semi-liquid steel can be measured quite accurately for filling the mold, and this means 1.5 to 3 times less metal waste compared to conventional hot stamping. The metal crystallized under pressure is completely sound, without any shrinkage cavities or porosity at the axis. The density, mechanical strength and plasticity of Bessemer

Card 1/6

Peculiarities of liquid steel ...

S/148/60/000/009/006/025
A161/A030

steel pressed in this way surpass these properties of not only cast but even forged and rolled metal. No segregation zones could be revealed in pressing by etching; over 90% of the liquid metal is utilized. First experiments (Ref.3) (P.N.Bidulya, I.I.Bobrov and K.N.Smirnova, "Liteynoye proizvodstvo", 1956, No.7) failed because of the insufficient pressure used. Various press mold designs had been tried since until the final mold was made. [Abstracter's note: No illustration or further description of the mold design is included]. The mold is installed in a hydraulic press. Hydraulic presses are the best suitable as pressure is applied without impact and can be maintained. Two pressing method variations are illustrated (Fig.1 and 2) schematically. The dies and punches made from soft 10Л (10L) steel withstand 2500 pressings provided that water cooling is used in the pressing process. The dimensions of pressings are near the required final. The effect of the applied pressure value on the mechanical properties of steel work has been studied. Spur gears of "45" steel were pressed for testing in the hydraulic mechanism of a dumpcar and remained good after the garanteed time of life; blanks of P 18 (R18) for cylindrical milling cutters were tested and found satisfactory. It is mentioned that the pressing

Peculiarities of liquid steel ...

process had been tried for the first time in 1943 at the machine plant in Mytischchi by a group of engineers headed by Engineer I.I.Bobrov. Experiments are continued for determining all technical details for series and mass production. There are 6 figures and 3 Soviet-bloc references.

ASSOCIATION: Moskovskiy vecherniy metallurgicheskiy institut (Moscow Evening Instituto of Metallurgy) and Mytischchenskiy mashinostroitel'nyy zavod (Mytischchi Machine Plant)

SUBMITTED: 26 March 1960

Card 3/3

BIDULYA, P.N., doktor tekhn.nauk, prof.; NOVIKOV, P.G., kand.tekhn.nauk; SHIRYAYEV, V.V., inzh.

Investigating the forced cooling of large steel castings in foundry molds. [Trudy] TSNIITMASH 97:50-73 '60. (MIRA 13:8)
(Steel castings—Cooling)

BEDULYA, P.N., prof., doktor tekhn.nauk; NOVIKOV, P.G., kand.tekhn.nauk; Frolova, M.V., inzh.; MANAKIN, A.M., kand.tekhn.nauk; FIKSEN, N.V., inzh.

Investigating the metal quality of large steel castings. [Trudy] TSNIITMASH 97:74-104 '60. (MIRA 13:8)
(Steel castings--Testing)
(Foundries--Quality control)

[redacted], V. V., and [redacted]

"Forced Cooling of Large Steel Castings in Moulds"

report presented at the 7th Conference on the Interaction of the Casting Mould and the Casting, sponsored by the Inst. of Mechanical Engineering, Acad. Sci. USSR, 25-29 January 1961.

PHASE I BOOK EXPLOITATION SOV/5696

Bidulya, Pavel Nikolayevich

Tekhnologiya stal'nykh otlivok (The Manufacture of Steel Castings) Moscow, Metallurgizdat, 1961. 352 p. 10,250 copies printed.

Ed.: S. Ya. Golovin; Ed. of Publishing House: A. G. Golyatkina; Tech. Ed.: P. G. Islent'yeva.

PURPOSE: This textbook is intended for students at schools of higher education specializing in steel casting, and may also be used by engineers and technicians in the metallurgical and machine industries.

COVERAGE: The book deals with steel-casting theory and practice. Methods of making carbon- and alloy-steel castings are described as they relate to particular purposes, sizes, and configurations. The steel-manufacturing process is also discussed. The author acknowledges the collaboration of I. I. Bobrov and K. N. Smirnov. There are 115 references: 87 Soviet, 14 English, 8 German, 3 French and 3 Czech.

Card 1/5

BIDULYA, P.N.; SHUL'TE, G.Yu.; PELIKH, V.N.; MLADOVA, A.A.; SHERSTYUK, A.A.; MIROSHNICHENKO, L.S.

Nonmetallic inclusions in malleable cast iron. Lit. proizv. no.1: 25-27 Ja '61. (MIRA 14:1)
(Cast iron--Defects) (Nonmetallic materials)

S/128/61/000/006/001/004
A054/A127

AUTHORS: Bidulya, P.N.; Iodkovskiy, S.A.; Sashchikhin, N.N.

TITLE: On the problem of melting steel with required phase composition

PERIODICAL: Liteynoye proizvodstvo, no. 6, 1961, 1 - 4

TEXT: The properties of a given steel grade may vary considerably in different heats. These fluctuations which are, as a rule, rather pronounced in double-phase (ferrite-pearlite, austenite-ferrite) steels, are due to deviations in the chemical composition within the limits allowed for the given grade. The different refining methods (vacuum treatment and electro-slag melting excluded) may change some of the steel properties within some tenth parts of one percent, whereas the changes in chemical composition also involving the change of phase composition are able to modify steel properties with several percents. To obtain stable qualities for double-phase steels not only the amount of each constituent must be stable, but the phase composition as well (there must be a fixed ratio of all composing elements, additives, gases, etc.). On the other hand when the phase composition is controlled during the melting process, the steel quality can be regulated according to requirements. TsNIITMASh designed a device with which it

On the problem of melting steel with....

S/128/61/000/006/001/004
A054/A127

is possible to melt the steel with a strictly prescribed phase composition. To develop the device austenitic steel was used with a certain amount of ferrite. The electromagnetic device is portable and determines the ferrite content in the furnace in 3 - 5 min. When current is supplied to the magnetic coil and to the induction coils, an inductive electromotive force is generated. Since identical induction coils are in cross connection, the galvanometer indicating the difference in electromotive force is in zero-position, i.e., the differential circuit is compensated. When a specimen with austenitic structure is put into one of these coils, the galvanometer remains in a neutral position, because the magnetic susceptibility of such a specimen is near that of the atmosphere. If, however, the specimen contains some ferrite, the electromotive force will increase in the core and the equilibrium of the circuit will be disturbed, which is indicated by the galvanometer depending on the ferrite amount in the sample. The stressed condition of the alternating magnetic field generated in the coils is not more than 300 cersted and this is not sufficient to magnetize the test sample up to saturation. Therefore, there is no linear relation between the ferrite quantity and the registrations of the device which is scaled according to the ferrite content of the check sample. The tests showed that upon applying the ferritometer it is possible to modify the composition of austenitic steel with ferrite phase

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in such a way that the amount of the latter is changed in the initial structure of the steel. In order to obtain the required ferrite quantity it was necessary to determine the effect of various alloying elements on the ferrite content. The results of tests carried out for this purpose with a different C, Si, Mn, Cr and Ni content in three heats are given in a table, while the composition of ЭИ316 (EI316) grade steel is plotted graphically, which ensures the optimum amount of ferrite. For a number of heat resistant steels TsNIITMASh and TsKTI have developed a technology ensuring the required ferrite amount. This improves the quality of steel and makes the automation of the melting process possible. There are 5 figures, 5 tables and 5 Soviet-bloc references.

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000205220018-1"

BIDULYA, P.N.; KOROLEV, V.M.; STEPANOV, V.M.

Methods in investigating metal fluidity and the formation of shrinkage cavities. Lit. proizv. no.8:29-31 Ag '61. (MIRA14:7)

(Founding--Testing)

SHUL'TE, G.Yu.; BIDULYA, P.N.

Form of graphite in malleable cast iron. Lit. proizv. no.1: 28-30 Ja '62. (MIRA 16:8)

(Cast iron—Metallography)

S/276/63/000/002/049/052
A052/A126

AUTHOR: Bidulya, P.N.

TITLE: Problems and outlook of heat-resisting alloy casting

PERIODICAL: Referativnyy zhurnal, Tekhnologiya mashinostroyeniya, no. 2, 1963, 20, abstract 2G93 (Sb. tr. Mosk. vech. metallurg.in-ta, no. 4, 1962, 74-80)

TEXT: The following scheme is suggested of technological operations which eliminate the formation of pores caused by gas shrinkage at exceptionally high conditions put to the density and faultless physical state of heat-resisting cast metal. Without exceptions, all alloys intended for heat-resisting casting must be sufficiently liquid and as far as possible fine-grained. Heat-resisting alloys must be cast in a vacuum or in a protecting atmosphere to eliminate the possibility of secondary oxidation of finished metal. The alloys must be poured either into the mold in a protecting atmosphere or into a vacuumized press mold, but in the latter case with an additional pressing of metal until the end of crystallization. The condition of ideal density of castings makes it imperative to observe all

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Problems and outlook...

S/276/63/000/002/049/052
A052/A126

three above-mentioned conditions which make the process of molten metal deformation by means of casting complicated and considerably more expensive. It is obvious that the presence of a small number of cavities which do not affect the quality of finished machine parts is an inevitable consequence of a correct evaluation of technological suitability of the selected processes and their costs. It is only under such conditions that the enormous advantages of casting can be utilized, of one of the most popular machine-building processes, of processes which are being improved and revised with the purpose of increasing the accuracy of blank dimensions and of approaching them to the dimensions of finished products.

(Abstracter's note: Complete translation.)

Card 2/2

BIDULYA, P.N.; SHUL'TE, G.Yu.; PELIKH, V.N.; MLADOVA, A.A.; KUSINSKIY, S.L.

Procedure for making castings of malleable cast iron. Lit. proizv. no.5:41 My '62. (MIRA 16:3)

(Iron founding)

KARP'OV, P.M.; BIDULYA, P.N.

Investigating the loss of design elements in the components of a cupola charge. Lit. proizv. no.8:24-26 Ag '62. (MIRA 15:11)
(Cupola furnaces)

BIDULYA, P.N.; SHUL'TE, G.Yu.

Effect of nonmetallic inclusions on the properties of malleable cast iron. Izv. vys. ucheb. zav.; chern met. 5 no.1:183-189 '62. (MIRA 15:2)

1. Moskovskiy becherniy metallurgicheskiy institut.
(Cast iron—Metallography)
(Iron founding—Defects)

ACCESSION NR: AT4016607 S/3071/63/000/000/0003/0007

AUTHOR: Lidulya, P. N. (Doctor of technical sciences, professor)

TITLE: The problems and future development of high temperature alloy castings for power equipment

SOURCE: Osnovny*ye zadachi razvitiya liteynogo proizvodstva i uluchsheniya yego spetsializatsii (Basic problems of the development of foundry production and the improvement of its specialization). 16 V sesoyuznaya n.-tekhn. konferentsiya. Trudy*. Moscow, 1963, 3-7

TOPIC TAGS: alloy casting, high temperature alloy, cast alloy, power equipment

ABSTRACT: The increase in the capacity and efficiency of power equipment for hydroelectric stations and for steam and gas turbines has caused intensive research by metallurgists. TsNIITMASH, the foundaries of the Elektrostal' mashinostroitel'ny*y zavod (Electric Steel Machine-Building Plant) and the Nevskiy zavod (Nevskiy Plant) in Leningrad have mastered casting of blades for immense hydraulic turbines, parts of steam turbines, gas turbines, and many high temperature steel parts. The theoretical basis for casting these alloys is that all alloys must have optimal casting features. The metal should be

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ACCESSION NR: AT4016607

poured into the mold either in protective surroundings to prevent oxidation and gas saturation, or in a vacuum with subsequent crystallization under high pressure. "V. M. Stepanov carried out part of the work."

ASSOCIATION: None

SUBMITTED: 00 DATE ACQ: 13Feb64 ENCL: 00

SUB CODE: MM, IE NO REF SOV: 009 OTHER: 000

Card 2/2

MOSTOVOY, A.B.; BIBULYA, P.N.; KOSENKOV, L.A.

Effect of heating on the heterogeneity of steel castings.
Lit. proizv. no.4:32 Ap '64.

(MIRA 17:7)

YUKALOV, I.N.; BIDULYA, P.N., zasl. deyatel' nauki i tekhniki RSFSR, doktor tekhn. nauk, prof., retsenzent;

[Castings of chemically stable alloys] Otlivki iz khimicheski stoikikh splavov. Moskva, Mashinostroenie, 1964. 230 p. (MIRA 17:11)

ACCESSION NR: AP4045808 S/0128/64/000/009/0006/0008

AUTHOR: Bidulya, P. N.,(Doctor of technical sciences)

TITLE: Theoretical analysis of steel pressing during crystallization

SOURCE: Liteynoye proizvodstvo, no. 9, 1964, 6-8

TOPIC TAGS: steel, steel die, steel crystallization, steel flaw, pressed steel, cast steel, liquid stamping

ABSTRACT: On the basis of a review of the literature and his own experience, the author attempts to formulate some theoretical aspects of the pressing process and to indicate optimal ways for further development. He points out that liquid stamping or pressing during crystallization differs from forging, rolling and hot stamping, and that liquid stamping should properly be called semi-liquid stamping, even though this is also not very precise. The shrinkage of steel castings during transition from a liquid to a solid and the supply kinetics of the liquid metal are discussed, and it is pointed out that the metal volumes introduced by the directed hardening method are of sufficient density in the absence of external pressure. Therefore, the outer volumes of a disk gradually thickening from the outer circumference to the center do not require pressing. A blowhole, however,

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ACCESSION NR: AP4045808

is formed in the center and must be filled by introduction of the die. Experience has shown that the die should not be put into the metal prematurely, since the metal shrinks while above the liquidus point and the metal penetrates into the die, wedging the moving parts. Pressure should be applied only at a temperature approximately in the middle between the liquidus and solidification temperatures. Besides, pressure changes the shape of the article. The beginning of pressure application should be chosen according to the crystallization rate. For example, a unit 100 mm thick reaches the critical temperature 15 seconds after the form is filled with metal at a temperature exceeding the liquidus temperature by 50C. The forms must then have a temperature of about 250-400C. The problem of die durability is also discussed. Properly used dies of 15L steel should last 3000 operations, although for very high accuracy this figure drops to 300. Durability can be increased either by reducing the stress at the working surface or by the design of more durable materials for the pressing equipment.. The author concludes that the term liquid or semi-liquid stamping is incorrect and does not reflect the new technology; it should therefore be replaced by "pressing during crystallization", or simply by "pressing". Pressed articles should be called castings, only with "pressed" added, showing that they differ from pressure castings and the products of hot stamping. In this technique, the highest pressure is required at the end of the process, resulting in dense parts with exact dimensions. Investigations carried out by engineers of the My*tishchinskiy and Ryazanskiy

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ACCESSION NR: AP4045808

Mashinostroitel'ny*ye zavody* (Mytishchinsk and Ryazan' Machine-Building Plants), as well as in the laboratories of the Moskovskiy vechernly metallurgicheskiy institut (Moscow Evening Metallurgical Institute) and the Moskovskiy nauchno-issledovatel'skiy tekhnologicheskiy institut (Moscow Scientific-Research Technological Institute), have laid the basis for pilot-plant studies, prior to the introduction of mass production. Hydraulic presses should be redesigned for delivering metal from furnaces into forms equipped with automatic pressure regulators. Orig. art. has: 1 figure.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: MM

NO REF SOV: 017 OTHER: 003

Card 3/3

L 19836-65 EWT(m)/EWA(d)/EWP(t)/EWP(k)/EWP(b) Pf-4 KJW/JD/HW

ACCESSION NR: AP4049076 S/0148/64/000/011/0189/0194

AUTHOR: Bidulya, P. N.; Kimov, V. S.; Iskakov, S. S.

TITLE: The effect of mechanical stress on the primary crystallization and properties of steel

SOURCE: IVUZ, Chernaya metallurgiya, no. 11, 1964, 189-194

TOPIC TAGS: steel crystallization, steel mechanical property, steel casting, steel stamping, grain formation

ABSTRACT: The structural flaws formed in casting of steel 45L were studied experimentally by subjecting cylindrical samples, 240 mm in diameter and 65 mm thick, to treatment in a hydraulic piston press with four types of dies: plane, cylindrical with a 40-mm height, hemispherical, and cylindrical with a 115-mm height. There was no slippage. The mechanical pressure was held constant at 14 kg/mm^2, and the samples were stamped before primary crystallization could take place. The plane-stamped samples still showed bubles and irregular mechanical properties. The cylindrically stamped samples showed a macrostructurally and microstructurally fine, even grain and no separation of elements. The edges of the grain showed no sulfides, phosphides, or blisters. Stamped nuts showed more desirable properties than cast nuts, with equally good grain after crystallization.

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L 19836-65

ACCESSION NR: AP4049076

6

A rapid heat exchange of cooling metal, nearly ideal contact between stamp and sample, and keeping gases in solution with the solid (which necessitates low working pressures of 3.5-19 kg/mm^2) are among the requirements for maintaining optimal grain formation. If the plane press requires pressures of 18-20 kg/mm^2, the cylindrical presses require only 8-10 kg/mm^2. The physico-mechanical properties of stamped metal are much higher than those of cast or even rolled metal. "S. M. Nesvit, A. A. Mishchenko, M. Ya. Shtigluz, A. A. Reppa and V. N. Zlodeyev also took part in the work." Orig. art. has: 3 diagrams, 3 tables, 1 formula, and 1 photomicrograph.

ASSOCIATION: Moskovskiy vecherniy metallurgicheskiy institut (Moscow Evening Metallurgical Institute)

SUBMITTED: 28Apr64 ENCL: 00 SUB CODE: MM

NO REF SOV: 016 OTHER: 002

Card 2/2

KARPOV, P.M.; BIELYA, P.N.

Oxidation of cupola charge components during preheating.
Lit. proizv. no.1:14-15 Ja '65.
(MIRA 18:3)

L 32719-65 EWP(w)/EWT(m)/EWA(d)/EWP(t)/EPR/EWP(k)/EWP(b) Pf-4 JD/HW/EM

ACCESSION NR: AP5003584 S/0128/65/000/001/0028/0031

AUTHORS: Kudrin, N. A.; Bidulya, P. N.

TITLE: Durability of molds and stamps during pressure casting and stamping of liquid steel

SOURCE: Liteynoye proizvodstvo, no. 1, 1965, 28-31

TOPIC TAGS: thermal stress, pressure casting, die life, metal stamping

ABSTRACT: The failure of molds and stamps during pressure casting and stamping of liquid steel is discussed. Failure can occur in the form of large thermal cracks, burnout channels, mold or die deformation, or a combination of these. The thermal stresses in two adjacent elements were expressed as

$$\sigma_1 = E\frac{F_2}{F_1+F_2}\alpha\Delta t,$$

(from P. N. Bidulya, Tekhnologiya stal'nykh otlivok. Metallurgizdat, 1961). The surface stresses which cause burnout channels were derived as

$$\sigma_2 = \alpha E\left[\Delta t_n - \Delta t_{cp}\left(1-\frac{B}{l}\right)\right]$$

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L 32719-65

ACCESSION NR: AP5003584

(where n and cp represent surface and average subscripts, and B- mold thickness, l- working surface perimeter of the mold section) when there are no phase changes and after the whole mold has heated to an average temperature. The number of cycles before failure due to thermal stresses was derived as

$$N_{TH} = K\frac{b}{\Delta\varepsilon - \varepsilon_T}$$

(where K = 0.001/K_n, $K_n = \frac{\sigma_p^{cp}\tau}{A}$, σ_p^{cp} = average $\sigma_p = \sigma_\xi - \sigma_s$; σ_s - yield stress at given temperature, τ - cycle time, $A = \rho_{ne}\frac{T_{ne}}{T_n}$, μ_{ne} - viscosity of mold metal at melting temperature, T_{ne} and T_n - melting temperature and mold surface temperature, δ - elongation %, $\Delta\varepsilon = \varepsilon_n - \varepsilon_{cp} + \varepsilon_p$, $\sigma_s/E_n = \varepsilon_s$, subscript p refers to heated layer of mold). The number of cycles to failure due to mold deformation was derived as

$$N_{cH} = \frac{H}{\varepsilon_0 l_0},$$

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$$\varepsilon_0 = \varepsilon_f - \frac{\sigma_s}{E_n};$$

$$\varepsilon_f' = \varepsilon_c \frac{1}{1 + \frac{E_f F_f}{E_{or} F_{or}}};$$

$$\varepsilon_c = \alpha_f \Delta t_f + \alpha_{or} \Delta t_{or};$$

(where f and OT correspond to mold and part respectively, F- cross sectional area, H- tolerance of the critical dimension, ε_∂ - deformation/cycle, l_0 - length of protrusion undergoing deformation). For best mold performance $\frac{N_{ca}}{N_{TH}} \approx 1$ should hold. The mold life can be increased by forced cooling which becomes effective for mold thicknesses greater than a critical thickness given by

$$N_f^{xp} = 2 N_{or} \frac{\lambda_f}{\lambda_{or}}$$

(where l- thickness, λ - kcal/mhrC). The above equations compared well with experimental results under various conditions. Orig. art. has: 19 formulas and 5 figures.

Card 3/4

L 32719-65
ACCESSION NR: AP5003584

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: IE, NM

NO REF SOV: 005 OTHER: 000

Card 4/4

BIDULYA, P.N.; SHUL'TE, G.Yu.; ANKVAB, K.M.

Gas content of malleable cast iron. Lit. proizv. no.2:26-27 F '65. (MIRA 18:6)

BIDULYA, P.N., doktor tekhn. nauk, prof.

Economics of metal shaping methods in manufacturing machine parts. Izv. vys. ucheb. zav.; mashinostr. no.3:12-16 '65. (MIRA 18:6)

1. Moskovskiy vecherniy metallurgicheskiy institut.

L 49446-65
EPF(n)-2/EPA(s)-2/EWP(k)/EWA(c)/EWT(m)/EWP(b)/EWA(d)/EWP(t) Pf-4/Pt-7/Pu-4
WW/JD/HW/JG
ACCESSION NR: AP5011075 UR/0117/65/000/004/0024/0025

AUTHOR: Bidulya, P. N. (Doctor of technical sciences) 35 B

TITLE: The problem of pressing steel parts by the method of liquid forging

SOURCE: Mashinostroitel', no. 4, 1965, 24-25

TOPIC TAGS: manufacturing method, forging, steel

ABSTRACT: In liquid forging, liquid metal is poured into the form and is pressed just before it becomes solid. The advantages of this method are a higher density of the material and more accurate product dimensions. The process is similar to pressure welding. Its economy depends mainly on the time required for the transition from liquid to solid state. The quality of the product is better than that obtained by casting under pressure or forging of heated materials. The principal characteristic of liquid forging is that steel is poured into an unheated form. Pressure is applied and increased gradually up to 8 kg/mm^2, then maintained until the crystallization of the metal is completed. The manufacturing of small parts takes 10 to 15 seconds. Tests were conducted to reach an economical relation between time and temperature. Exposing the metal to pressure during crystallization was found to be the most effective method to improve the economy and the

Card 1/2

L 49446-65

ACCESSION NR: AP5011075

quality of production in all known processes. Liquid forging could eliminate additional finishing operations required in other processes. The problems of a large scale application of this method in the SSSR factories are discussed. Orig. art. has: 4 figures.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: IE, MM

NO REF SOV: 000 OTHER: 000

Card 2/2 CC

BIDNYA, P.N., doktor tekhn.nauk; VASILEVSKIY, P.F., kand.tekhn.nauk; GOLOVACH, Yu.Yu., inzh.

Investigating the crystallization and the flow of liquid steel in gating system channels. Lit. proizv. no.7:19-21 Jl '65.
(MIRA 18:8)

BIDULYA, P.N.; GOLOVACH, Yu.Yu.

Pressure loss in the passageways of a gating system. Izv. vys. ucheb. zav.; chern. met. 8 no.7:166-174 '65. (MIRA 18:7)

1. Moskovskiy vecherniy metallurgicheskiy institut.

L 12172-66 EWT(m)/EWA(d)/EWP(t)/EWP(z)/EWP(b) MJW/JD

ACC NR: AP6000178 UR/0148/65/000/009/0184/0186

AUTHOR: Bidulya, P. N.; Iskakov, S. S.; Kimov, V. S.

ORG: Moscow Evening Metallurgical Institute (Moskovskiy vechernyy metallurgicheskiy institut)

TITLE: Effect of pressing parameters on the crystallization of steel castings pressed in molten state

SOURCE: IVUZ. Chernaya metallurgiya, no. 9, 1965, 184-186

TOPIC TAGS: metal pressing, molten metal, metal crystallization, die, metal casting

ABSTRACT: The development of a method of producing castings by pressing in molten state (P. N. Budulya, S. S. Iskakov, V. S. Kimov. Liteynoye proizvodstvo, 1956, no. 7) makes it possible to obtain compact castings with a good surface and minimal machining tolerances. In this connection, the authors investigated the effect of such pressing parameters as unit pressure, pressing time, die temperature, metal-pouring temperature, pressing rate, etc., on the crystallization of castings of 45 steel. The sequence of the technological cycle was as follows: Molten steel obtained by remelting in an acid induction furnace with the aid of a chamotte-graphite proportioning crucible heated to 900-1000°C, was poured into a die mounted on the bolster of a hydraulic press, and pressed. The press cross-arm moves at the rate of 20 mm/sec and

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ACC NR: AP6000178

picks up maximum pressure within 13 sec. After corresponding exposure under pressure, the cross-arm with the punch moves upward and the pressed casting is extracted from the die and immediately placed in a heating furnace. In this case, the required critical pressure was determined by varying the load applied from 0 to 20 kg/mm^2, and was found to increase with increasing wall thickness of the billet. It was established that the rate of crystallization under pressure is 3-5 times as high as for free crystallization; this is apparently due to the increased drain of heat due to the elimination of the gap between the walls of die and casting and the increase in the number of the nuclei of crystallization owing to deep supercooling. Die and punch temperatures of up to 150°C considerably increase the solidification rate; any further heating above 200°C, however, hardly affects the required pressing time. A similar effect is produced by the pouring temperature: the limit beyond which the heating temperature of the steel ceases to affect significantly the solidification time of the casting is heating to 80-100°C above the liquidus. Deviations from these rules lead to various kinds of defects. Further, it was established that the pouring of steel into a cold die (20 to 100°C) results in a coarse dendritic structure of the casting, whereas heating of the die to 200-250°C assures a crack-free uniformly fine-grained structure. Orig. art. has: 2 figures.

SUB CODE: 11, 13/ SUBM DATE: 20Feb65/ ORIG REF: 000/ OTH REF: 000

HW

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BYDULYA, P.N.

Experimental determination of the coefficient of lift from supersonic nozzles. Izv. vys. ucheb. zav.; aviats. tekh. no.1:161-165. (MIRA 18:11)

1. Moskovskiy vechernyy aviatsionnyy tekhnicheskiy institut.

L 44012-66 EWT(m)/EWP(v)/T/EWP(t)/ETI IJP(c) JD

ACC NR: AP6021710 (N) SOURCE CODE: UR/0148/66/000/003/0167/0170

AUTHOR: Bidulya, P. N.; Saramutin, V. I.; Iskakov, S. S.

36
35B

ORG: Moscow Evening Metallurgical Institute (Moskovskiy vechernyy metallurgicheskiy institut)

TITLE: Increase in the density and strength of low-alloy steel during crystallization und pressure

SOURCE: IVUZ. Chernaya metallurgiya, no. 3, 1966, 167-170

TOPIC TAGS: high temperature pearlitic steel, steel, pressure casting, metal crystallization, specific density / 15KhlM1FL pearlitic steel

ABSTRACTS: The article presents the results of an investigation of the properties of pressure-die cast ingots of high-temperature pearlitic 15KhlM1FL steel (~0.16% C, ~44% Si, ~0.48% Mn, ~1.4% Cr, ~1.2% Mo, ~0.22% V, ~0.034% S, ~0.019% P) crystallizing while in the pressure die, as a function of specific casting pressure p_{sp} per unit cross sectional area of the ingot (4 to 20 kg/mm^2). The density of this steel, as determined by the method of hydrostatic weighing and checked by the roentgenoscopic method, was found to increase from

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7.807 kg/cm^3 for p_{sp} = 4 kg/mm^2 to 7.868 kg/cm^3 for p_{sp} = 20 kg/mm^2. Thus, at low pressures, e.g. when p_{sp} = 4 kg/mm^2 the steel's density is lower (7.807 kg/cm^3) than the density of the steel crystallizing while not under pressure (7.824 kg/cm^3). The reason is that in the case of crystallization without pressure the shrinkage defects are chiefly represented by a concentrated shrinkage cavity, whereas in the presence of a low pressure exerted by the punch against the metal, there forms a strongly developed shrinkage porosity. The cooling conditions of the ingot also affect the density: if the molten steel is poured into a pressure-die that has a temperature of 20°C, the density of the castings is smaller than that of the castings produced with pressure-dies heated to 200-280°C. Clearly, the lower the cooling rate of the casting in the pressure-die is (i.e. the higher the temperature of the pressure-die is), the higher the density of the casting is. For 15Kh1M1FL steel the optimal conditions of pressure--die casting are: p_{sp} = 20 kg/mm^2, pressure-die temperature 200-280°C, and pouring temperature (temperature of pouring into pressure-die) 1540-1560°C; the ingots thus obtained display mechanical properties superior to those of the same steel when cast by ordinary techniques, because such pressure-die casting eliminates shrinkage porosity and gas porosity and provides the premises for the so-called "weldability" of grains, i.e. for a state in which the grain boundaries cease to be the weak link and are not inferior in strength to the grain body itself.

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Thus, when subjected to tensile tests at 660°C under a load of 22 kg/mm^3, specimens of pressure-die-cast 15KhlM1FL steel withstood fracture for an average of 286 hr compared with 204 hr for specimens of the same steel cast by ordinary techniques. Orig. art. has: 5 figures.

SUB CODE: 11, 20, 13/ SUBM DATE: 07Apr65/ ORIG REF: 008/

BIDULYA, V. I.

AUTHOR: Ivankin, Ya.I., Kovalevskiy, P.P., Bidulya, V.I., Tsukur, I.D. 32-9-29/43

TITLE: Perfectioning of the Control of Apparatus for Industrial Gamma Defectoscopy (Usovershenstvovaniye upravleniya apparatov dlya promyshlennoy gamma-defektoskopii)

PERIODICAL: Zavodskaya Laboratoriya, 1957, Vol.23, Nr 9, pp.1127-1128 (USSR)

ABSTRACT: The apparatus GUP-Co-5-1 and GUP-Co-50-1, which are being produced by the "Mosrentgen" plant, have an important disadvantage in that the switchboard for the radioactive source is mounted immediately on the understructure of the device near the protective shield of the preparation. Here a new construction, in which the switchboard is fitted on a separate table, is described. By making use of a cable of 21 m length, which connects the apparatus with the operator stand, and of an operating stand of 7 m length, the person operating controls is able to work at a distance of 28 m from the source from an open stand, so that full safety is warranted. There is 1 figure.

ASSOCIATION: Dnepropetrovsk Plant for Metallurgical Equipment (Dnepropetrovskiy zavod metallurgicheskogo oborudovaniya)

AVAILABLE: Library of Congress

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7(1)

AUTHORS: Bidulya, V. I., Rybatskiy, V. V. SOV/32-25-2-58/78

TITLE: An Acoustic Layer of Water Glass for the Ultrasonic Materiology of Products With Unfinished Surfaces (Akusticheskaya prosloyka iz zhidkogo stekla dlya ul'trazvukovoy defektoskopii izdeliy s neobrabotannoy poverkhnost'yu)

PERIODICAL: Zavodskaya Laboratoriya, 1959, Vol 25, Nr 2, p 236 (USSR)

ABSTRACT: Metal samples with unfinished surfaces can be examined by means of ultrasonic materiology by applying to the rough surface of the sample a layer of a material whose acoustic rigidity is similar to that of the metal. Experiments showed that a water glass layer serves the purpose best (Fig). In the examination of forgings with artificial and natural flaws constant impulses were obtained. A comparison with transformer oil as a contact medium in examinations of steel standard samples also confirmed the advantages of water glass as a contact medium. Thus, when water glass is used wrong impulses never occur, or if so, only with much higher amplifications

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and capacities than with use of transformer oil.
There is 1 figure.

ASSOCIATION: Dnepropetrovskiy zavod metallurgicheskogo oborudovaniya (Dnepropetrovsk Plant for Metallurgical Equipment)

AUTHORS: Rzhanov, A. V., Arkhipova, I. A., Bidulya, V. N. 57-28-5-23/36

TITLE: On the Applicability of the Method of Velocity Measurement of Surface Recombination by Means of the Change of Semiconductor Resistance in a Magnetic Field (O primenimosti metoda izmereniya skorosti poverkhnostnoy rekombinatsii po izmeneniyu soprotivleniya poluprovodnika v magnitnom pole)

PERIODICAL: Zhurnal Tekhnicheskoy Fiziki, 1958, Vol. 28, Nr 5, pp. 1051-1052 (USSR)

ABSTRACT: In the paper by Zhuze, Pikus and Sorokin (Ref 1) a new method of measuring the surface recombination velocity s by means of the modification of the resistance of a thin semiconductor sample in a magnetic field was proposed. The author of this letter to the editor employed the described method in the investigation of the modification s according to the change of the electric surface potential. The measurements were conducted with two devices. One served for the measurement of the constant component E_c, one of the sample surfaces being subjected to the action of a constant transverse field or of various gas media. On the other device the voltage of the doubled frequency $E_{2\omega}$ was mea-

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On the Applicability of the Method of Velocity Measurement of Surface Recombination by Means of the Change of Semiconductor Resistance in a Magnetic Field 57-28-5-23/36

sured, one of the surface media being subjected to the action of a sinusoidal transverse field with low frequency. The obtained results show, that the method of measuring the surface recombination velocity by means of the modification of the conductivity of the samples in a magnetic field yields correct values of Δ_s at a modification of the concentration of the recombination centers which was also proved by grinding experiments. If s changes because of the modification of the electrostatic surface potential, this method, however, gives too low values. This can be seen from a direct comparison of this method with the bridge method of measuring the effective life. The authors thank Yu.F. Novototskiy-Vlasov for his help. There are 1 figure and 5 references, 4 of which are Soviet.

ASSOCIATION: Fizicheskiy institut im. P.N. Lebedeva AN SSSR, Moskva (Moscow, Physics Institute imeni P.N. Lebedev, AS USSR)

SUBMITTED: December 28, 1957

Card 2/2 1. Semiconductors--Surface properties

MARMORSHTEYN, S.Ya.; TRAKHTENBERG, A.Kh.; BIDYAK, I.V.

Method of combined intravenous phlebography and azygography in cancer of the lungs. Vop. onk. 11 no.3:99-104 '65.
(MIRA 18:6)

1. Iz khirurgicheskogo (zav. - prof. N.D. Garin) i rentgenodiagnosticheskogo (zav. - doktor med. nauk Ye.A. Likhtenshteyn) otdeleniy Gosudarstvennogo onkologicheskogo instituta imeni Gertsena (dir. - prof. A.N. Novikov), Moskva.

GRODZINSKIY, D.M.; BIDZELYA, N.I.; GOLIKOVA, O.P.

Factors of radiosensitivity of plants following γ irradiation.
Radiobiologiia 5 no.4:596-601 '65. (MIRA 18:9)

1. Institut fiziologii rasteniy AN UkrSSR, Kiyev.

SHAKHOV, A.A.; BIDZELYA, N.I.; STANKO, S.A.; NABIULLIN, F.Kh.

Photoinduced EPR signals in seeds. Biofizika 10 no.4: 710-713 '65. (MIRA 18:8)

1. Institut fiziologii rasteniy im. K.A. Timiryazeva AN SSSR, Moskva; Institut fiziologii rasteniy AN UkrSSR, Kiyev i Vsesoyuznyy nauchno-issledovatel'skiy institut istochnikov tokov, Moskva.

BIDZHIYEV, R.A.; ZEMSKOVA, G.K.; NEVYAZHSKIY, I.I.; SHIROKOVA, I.Ya.

New discoveries of Tertiary flora in central Yakutia. Trudy VAGT no.2:177-179 '56. (MLRA 10:5)
(Yakutia--Paleobotany, Stratigraphic)